

Wright, T. R. F. University of Virginia,
Charlottesville, Va. Virginator Stocks.

The following stocks should be useful to those who need large numbers of attached-X virgins for screening sex-linked recessive mutations or for those who need large

numbers of "Balancer" virgins for screening for 2nd or 3rd chromosome recessive mutations. In each case the parental flies are raised at room temperature (21-22°C) and are then transferred to new bottles which are placed in an incubator at 29-30°C. One week later these parents are cleared from the bottles which are then returned to the 29-30°C incubator. Since all male offspring will be hemizygous for the parental X chromosome which carries a recessive, sex-linked, temperature-sensitive lethal, they should all die, and therefore all females hatching in the culture will remain virgin. Some detachments of C(1)RM,y (attached-X) do occur and occasional breakthroughs of the 1(1)myst^{ts2} males are found. However, so far all of these males have proved to be sterile, perhaps because they developed at 29-30°C. The exclusively female progeny are routinely collected from the 29-30°C cultures twice a week, on Mondays and on Fridays, and stored in vials until needed. The presence or absence of larvae in these storage vials provides a final check on the virginity of the females. The stocks are:

C(1)RM,y x 1(1)myst^{ts2}

C(1)RM,y; SM5/Sp bw^D x 1(1)myst^{ts2}; SM5/Sp bw^D

C(1)RM,y; TM3,Ser/Sb x 1(1)myst^{ts2}; TM3,Ser/Sb

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Saskatchewan, Canada. The use of a behavioural character in population genetics.

Traditionally the population geneticist studies characters such as the number of bristles on one of the thoracic or abdominal segments of *Drosophila melanogaster*. While *Drosophila* spp. are organisms which commend themselves alike for

teaching and research the advantages of the characters which are so often studied are much less numerous. Counting bristles is a tedious and laborious process which may well limit the size and the number of the populations studied in any single experiment. The use of a behavioural character for such studies greatly increases the number of individuals that may be classified in a single experiment; for, with a character of this type, the flies classify themselves.

Hirsch (1959) first drew attention to the inheritance of a response to gravity in the fruit fly. He designed a geotactic selection maze which provided the flies with 15 choices to go up or down; from these they emerged into 16 collecting tubes. Using this maze, a population of about 200 flies might be classified in 12 hours.

The author has presented details of a modified version of the Hirsch maze which is much more easily constructed and through which the same number of flies will pass in about half an hour (Walton, 1968). Experiments using this maze have shown that, provided populations of not fewer than 50 individuals are used, and that the flies emerged not more than a week before, then accurate and repeatable geotactic scores are obtained. If flies more than one week old are used the mean geotactic score for the population is higher, while if the population is smaller than 50 then the variance is greater.

Using populations of 100 flies for each test it was possible to classify the progenies from a 8 x 8 diallel cross with two replications in 64 working hours. If three mazes and two operators are available then such an experiment could be completed in three working days. The time required for introducing the flies into the maze, and for counting and recording numbers in the collecting tubes is such that, with three mazes, two operators are fully occupied.

The maze may be used in two ways to select populations which show positive and negative geotaxis. These methods, with supporting experimental evidence, have been presented elsewhere by the author (Walton, 1968).

References:

- Hirsch, J. 1959. Studies in experimental behaviour genetics; II. Individual differences in geotaxis as a function of chromosome variations in synthesized *Drosophila* populations. *J. Comp. Physiol. Psychol.*, 52: 732-739.
- Walton, P. D. 1968. Factors affecting geotaxis scores in *Drosophila melanogaster*. *J. Comp. Physiol. Psychol.*, In press.